

EDGEMASTERX

How to measure multiple edges in only one measurement run

THE SYSTEM

Automated cutting edge measurement

The EdgeMasterX is a fully automated cutting edge measurement device for production integrated quality assurance of inserts, drills, mills and other round tools. Specifically, the EdgeMasterX enables automated multi-edge measurement of tools. In a single measurement run, a complete series of user defined measurements at multiple edge positions can be achieved. The system is designed to implement fully automated quality assurance into the production process. All results are traceable, repeatable, and in high vertical resolution.

THE BENEFITS

Automatic measurement of multiple edges

Users can measure defined edge parameters on various tool positions to verify, for example, cutting edge preparation processes. In addition, form and roughness of a specific position can be analyzed and compared across multiple tools within a batch. When utilized in combination with a motorized rotation unit, users benefit from the measurement of multiple tool edges, even chamfered edges, in one single measurement run. The user interface design is simplistic and user-friendly having a single button solution allowing for measurements to occur without any further user interactions. Upon completion of the scan, deviations from a CAD dataset are easily visible as a traffic light system is used to indicate differences and non-conformities.

ALICONA TOOL MEASUREMENT SYSTEMS

High resolution cutting edge measurement systems in production

The EdgeMasterX originates from the Alicona product line for automatic tool measurement and represents an enhancement of the original EdgeMaster. Both systems are designed for production integrated quality assurance and enable traceable and repeatable measurements even when vibrations, changing temperatures and ambient light are incurred. Typically, users measure edge parameters such as radii, angles, chipping, wear and roughness.



EDGEMASTERX

TECHNICAL SPECIFICATIONS

GENERAL SPECIFICATIONS

Measurement principle	non-contact, optical, three-dimensional, based on Focus-Variation
Max. number of measurement points in a single measurement	X: 2040, Y: 2040; X x Y: 4.16 million
Max. number of measurement points	X: 62500, Y: 62500; X x Y: 500 million
Positioning volume (X x Y x Z)	mot.: 50 mm x 50 mm x 155 mm (Z: 25 mm mot., 130 mm man.) = 387500 mm ³
Ring light illumination	white LED high-power ring light, 24 segments
Positioning help	coaxial laser beam
Dimensions (W x D x H)	measurement instrument: 195 mm x 316 mm x 418 mm, ControlServerHP: 190 mm x 500 mm x 450 mm
ControlServerHP	12 Core, 32 GB, 24" Full HD LED Monitor
Applications	automated tool measurement in production with automatic multi edge measurement; applied for quality assurance of inserts, millers, drills and other round tools.

MEASUREMENT OBJECT

Surface texture	surface topography Ra above 0.009 µm with λ_c 2 µm; depending on surface structure
Max. height	155 mm (more with respective grip)
Max. weight	4 kg; more on request
Diameter	0.5 mm - 40 mm (in combination with Real3D Rotation Unit G2)

OBJECTIVE SPECIFIC FEATURES

Objective magnification (*)		10x	20x	50x	2xSX	5xSX	10xSX	20xSX	50xSX
Working distance	mm	17.5	13	10.1	34	34	33.5	20	13
Lateral measurement range (X,Y) (X x Y)	mm	2	1	0.4	10	4	2	1	0.4
	mm ²	4	1	0.16	100	16	4	1	0.16
Measurement point distance	µm	1	0.5	0.2	5	2	1	0.5	0.2
Measurement noise	nm	40	20	10	1240	180	45	25	15
Vertical resolution	nm	100	50	20	3500	510	130	70	45
Vertical measurement area	mm	16	12	9	25	25	25	19	12

(*) Objectives with higher working distance available upon request

RESOLUTION AND APPLICATION LIMITS

Objective magnification		10x	20x	50x	2xSX	5xSX	10xSX	20xSX	50SX
Min. measurable radius	µm	5	3	2	20	10	5	3	2
Min. measurable wedge angle	°	20							
Min. measurable roughness (Ra)	µm	0.3	0.15	0.08	n.a.	n.a.	0.45	0.25	0.15
Min. measurable roughness (Sa)	µm	0.15	0.075	0.05	n.a.	n.a.	0.25	0.1	0.08
Max. bevel length	µm	800	400	160	4000	2000	800	400	160
Max. measurable slope angle	°	87							

ACCURACY

Profile roughness	Ra = 0.5 µm	U = 0.04 µm, σ = 0.002 µm
Area roughness	Sa = 0.5 µm	U = 0.03 µm, σ = 0.002 µm
Wedge angle	β = 70 ° - 110 °	U = 0.15 °, σ = 0.02 °
Edge radius	R = 5 µm - 20 µm R > 20 µm	U = 1.5 µm, σ = 0.15 µm U = 2 µm, σ = 0.3 µm

SOFTWARE

Measurement modules	Standard: automatic edge measurement (edge radius, form, contour, form deviation), multi edge measurement Optional: chipping, roughness, edge break
Automation	integrated scripting language; labview framework; .NET remoting interface
Languages	German, English, French, Korean, Japanese, Chinese
Export formats	3D data sets (e.g.: AL3D, STL, G3D, Open GPS, IGES, STEP, CSV, QDAS), image formats (e.g.: BMP, JPG, PNG)
Import formats	3D data sets (e.g.: AL3D, STL, G3D), image formats (e.g.: BMP, JPG, PNG)